

**What is claimed is:**

1. A tractive linear reciprocating driving apparatus comprising:

a frame of the driving apparatus composed of a guide column, an auxiliary frame pillar and frame end plates, two opposite ends of the frame each equipped with a flywheel and a slave sprocket, respectively, with a single endless chain operatively connected therebetween to form a chain ring, the guide column used for unidirectional linear sliding and the auxiliary frame pillar positioned on a plane that is parallel to the endless chain ring plane; and

a sliding assembly used for driving and a slave chain-engaging and reversing mechanism thereof mounted on the guide column,

the sliding assembly having upper and lower slide bars mounted on the guide column for sliding along the guide column, at least one pedal and at least one hand-controlled rod used for propulsion mounted on an outside butt plate of the sliding assembly;

wherein:

a chain engagement means of said slave chain-engaging and reversing mechanism is positioned in the endless chain ring plane, chain engagement means being connected with upper and lower slave slide bars that are mounted on the guide column, a chain engaging tooth plate being provided in the chain engagement means and one end of the chain engaging tooth plane being is float-connected with the sliding assembly via connecting pieces including a pull-up rod, a pull-down rod and a nose of a connecting rod; two chain-engaging teeth on the chain engaging tooth plate tilted towards two opposite directions and alternatively engaging the endless chain, in cooperation with a chain-retaining board having a chain-retaining arc projection;

a reversing compensation means used with the slave chain-engaging and reversing mechanism has a resilient member that can contact a front surface of a chain tooth on the flywheel or the slave sprocket directly or indirectly in inverse direction, and a space or clearance is reserved for movement.

2. The tractive linear reciprocating driving apparatus according to claim 1, wherein said reversing compensation means is a resilient contact mobile member mounted on or beneath the slave sprocket and an arm of the resilient contact mobile member elastically contacts the front surface of a chain tooth of the slave sprocket.

3. The tractive linear reciprocating driving apparatus according to claim 1, wherein said reversing compensation means is a modified single-stage flywheel in which there is a structural member for transmission of force between a leaf spring and a chain tooth of the flywheel, the leaf spring pressing a rear end of a jack located near an inner periphery of the flywheel to make the jack firstly elastically contact a front surface of trapezoid shape rackets on the inner periphery of the flywheel and then indirectly contact the front surface of a chain tooth on an outer hull of the flywheel.

4. A tractive linear reciprocating driving apparatus comprising:

a frame of the driving apparatus composed of a guide column in parallel with an auxiliary frame pillar, and two parallel frame end plates in perpendicular position connecting both ends of the guide column and the auxiliary frame pillar to form a generally rectangular shape, two opposite ends of frame each equipped with a flywheel and a slave sprocket, respectively, with a single endless chain operatively connected therebetween to form a chain ring, the guide column used for unidirectional linear sliding and the auxiliary frame pillar positioned on a plane that is parallel to the endless chain ring plane; and

a sliding assembly used for driving and a slave chain-engaging and reversing mechanism thereof mounted on the guide column,

the sliding assembly having upper and lower slide bars mounted on the guide column for sliding along the guide column, at least one pedal and at least one hand-controlled rod used for propulsion mounted on an outside butt plate of the sliding assembly;

wherein:

a chain engagement means of said slave chain-engaging and reversing mechanism is positioned in the endless chain ring plane, chain engagement means being connected with upper and lower slave slide bars that are mounted on the guide column, a chain engaging tooth plate being provided in the chain engagement means and one end of the chain engaging tooth plane being float-connected with the sliding assembly via connecting pieces including a pull-up rod, a pull-down rod and a nose of a connecting rod; two chain-engaging teeth on the chain engaging tooth plate tilted towards two opposite directions and alternatively engaging the endless chain in cooperation with a chain-retaining board having a chain-retaining arc projection;

a reversing compensation means used with the slave chain-engaging and

reversing mechanism has a resilient member that can contact a front surface of a chain tooth on the flywheel or the slave sprocket directly or indirectly in inverse direction, and a space or clearance is reserved for movement.